Red Hill Bay Restoration

Project Budget

Task	**Expense Details**	**Funding Source & Cost**		
(see project image for naming) **A. Construction**	(cubic yards= cy)	FAP	SBSSNWR	IID
1.Initial land surveys and concept development, planning, engineering,graphics.	Surveys=$20,000 Planning, preliminary engineering, graphics=$30,000			$50,000
2.Divert drainage water that continues flowing into RHB to dry basin and prepare for berm const.	Drainage channel 6,500'L x 5'W x 3'D = 3,482 cy. @ $20 per = $69,640		$69,640	
3. Construct RHB 2 Berm @ mouth of RHB to keep periodic wind generated flows out of RHB.	RHB 2 Berm= 7,964 cy @ $20 per = $159,280 WCS x 2 installed= $15,000		$174,280	
4. Construct Saltwater Intake Channel from edge of Salton Sea to Pumping Plant to supply saltwater into system.	Saltwater Intake Channel 10'W x 10'D x 6.050'L w/ adjacent berm 2'H x 20'W= 29,745 cy @ $20 per= $594,900	$594,900		
5. Construct Alamo River supply Channel to get Alamo River water to pumping plant.	Alamo River supply channel 10'W x 6'D x 1,600'L = 4,992 cy @ $20 per = $99,840.		$99,840	
6. Install Concrete intake structure at Alamo River that connects to channel.	Concrete intake structure and installation = $20,000			$20,000
7. Construct/install concrete structure and siphon under RH Marina Rd. to deliver Alamo River water in excavated channel past RH Marina Rd. to pumping plant.	A concrete water control structure and siphon or culvert under Red Hill Marina Rd. 42"W x40'L . Design, county permit, purchase, contract installation.	$50,000		

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8. Construct RHB water pumping plant to distribute blended water from the Salton Sea and Alamo River into a mixing basin and from there into Red Hill Bay 1. Pumping will require variable rates of salt and drain water to accommodate changing water conditions in the habitat.	Pumping facility. One 10" Hidrostal centrifugal screw–type "fish friendly" pump for saltwater and one backup and installation plumbing @ $80,000 ea = $160,000. One 12" Hidrostal centrifugal screw–type "fish friendly" pump for drain water and one backup and installation plumbing @ $80,000 ea = $160,000. Concrete infrastructure to support pumps and distribute water = $200,000. Mixing basin = $5,000.	$525,000		
9. Construct RHB 1 Berm to impound blended water in the first bay, Red Hill Bay 1. Tie the berm into the south bank of the saltwater intake channel/berm.	RHB 1 Berm = 3.5'H x 20'W x 4,800'L = 7,591 cy @$20 per = $151,820. Two wcs's installed = $15,000	$174,320		
10. Extend 3-Phase electrical power supply from Sinclair Rd. 6,700' north to the project site to provide sufficient power to meet all pumping needs of the project and capacity for increased need in the future.	An installed 3-Phase electrical power line. 6,700 ln.ft. @ $80/ft= $536,000.	$536,000		
11. Build Boundary Berm on the east edge of the project to keep impounded water from Red Hill Bay 1 from the 400' strip of land between Garst Rd. and the Boundary Berm (poss.future location of geothermal facilities). This road may also provide future access for birdwatchers to view birds.	Boundary Berm 2.5'H x 20'W x 5,000'L = 5,093 cy @ $20 per = $101,852.	$101,852		

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12. Connect saltwater intake channel out into the Salton Sea to a depth of 12" to ensure adequate saltwater flow to the pumping plant for distribution to Red Hill Bay 1.	Saltwater intake channel connection to Sea, excavation = 100'L x 10'W x 12"H = 36 cy @ $30 per = $1,080. 24" x 4' sheet piling, made, installed = $10,000. Matting to drive excavator/backhoe into water = $5,000		$16,080	
13. Enhance/excavate low flow swales in each of the bays, connecting inflows to the outflows. Use excavated soil from swales to build loafing/nesting islands. Excavate deep pools as needed for island construction.	Twenty islands 30'W x 60'L, armored with 1"-3" crushed rock = 90 cy x 20 @ $ 20/cy = $36,000. Broad low flow swales. Cost = excavated soil for islands. Deep pools. Cost = excavated soil for islands.		$36,000	
14. Place dead tree snags or similar material to attract potential wadingbird nesting. Also need concrete culvert pipe dispersed in the swales and throughout the bays to shelter fish.	Approx. twenty tree snags = $10,000. Approx. twenty 20" concrete culvert pipe = 20 x $300 = $6,000.		$16,000	
15. Install 15,000 ln. ft. environmentally sensitive erosion control	Erosion control on berm banks for RHB1, RHB2, and south bank of Saltwater Intake Channel.		$30,000	
16.10% contingency	Const.cost contingency from $1,982,072	$198,207		
17.Engineering, final design	Design/drawings	$200,000		
18.Surveying	Survey, staking	$25,000		
19.Construction Management		$150,000		
B. Project Administration				
1. Flow of administrative functions	Preparation of invoices, record keeping. 80 hrs @ $22.5/hr and 80 hrs @ $54/hr		$6,120	

2. Reporting	Documenting summaries of accomplishments, milestones. 40 hrs @ $54/hr.		$2160	
C. Land Lease				
1. Acquiring long-term lease	Refuge staff administrative time 40 hrs. @ $54/hr. IID staff time 20 hrs. @ $54/hr.		$2,160	$1080
D. Planning, Design, Engineering, Environmental Documentation				
1. Initial surveys.	See A.1.			See A1
2. Final Design	Engineered project plans	See A.17.		
3. Environmental documentation	Researching, investigating, writing 120 hrs. @ $44/hr		$5,280	
4. Permitting	Researching, writing 60 hrs. @$44/hr.		$2,640	
E. Environmental Compliance				
1. Environmental Compliance	Costs are captured elsewhere in A8, A12-14.		See A8,A12-14.	
F. Monitoring				
1.Pesticides	Analysis Alamo R. $54,600 RHB site sediments $39,600 USGS staff/travel $40,250	$189,050		
2.Selenium Analyses and Invertebrate Speciation	Quarterly SE Analysis (water, sediment, corixids, benthic inverts, gambusia) for two years. $87,840 USGS staff/travel $101,060	$236,125		
3.Bird and Fish surveys	FWS Staff time		$9,820	
Total		**$2,980,454**	**$470,020**	**$71,080**